

Changes in plasmatic redox status following low-moderate intensity interval exercise training in rhythmic gymnastics trainers

Marianna Bellafiore^{1,2}, Giuseppe Battaglia^{1,2}, Giovanni Caramazza^{1,2}, Maria Silvia Naccari², Antonino Bianco^{1,2} and Antonio Palma^{1,2}

¹ Department of Low, Society and Sport Sciences, Palermo University, Palermo, Italy

² Regional Sport School of CONI, Sicily, Italy

Different types and intensities of exercise may induce varying levels of reactive oxygen species and antioxidants affecting plasma redox state in a specific way (Bloomer et al., 2005). The aim of our study was to investigate whether the plasmatic production of H₂O₂ and antioxidant capacity changed in response to a low-moderate intensity interval training session and after 48 hours of recovery in rhythmic gymnastics trainers.

Ten women (age: 23.8 ± 3.42 y; weight: 52.58 ± 4.57 kg; height: 158.42 ± 2.20 cm; body mass index: 20.88 ± 1.23) with 13.14 ± 5.40 years of experience in rhythmic gymnastics and trainers from at least 4 years at a competitive level voluntarily participated in this study. One week before the training session, trainers performed a laboratory graded exercise test on the treadmill in order to determine their maximal heart rate (HR_{max}) and maximal oxygen consumption (VO_{2max}). Following, they executed a interval training session at an average intensity of 57% FC_{max}, mainly in aerobic condition and only 2% of total time in anaerobic condition. The session included exercises typical of rhythmic gymnastics and a competition simulation. Immediately before and after the training session, blood samples were taken from trainers and H₂O₂ levels and antioxidant capacity were measured by dROMs and BAP test, respectively. The same think was performed after 48 h of recovery.

After training, H₂O₂ levels were significantly lower than baseline; however they increased until to reach the baseline following 48 h of recovery. Antioxidant capacity decreased after training and was significantly higher than baseline after 48h of recovery.

These results show that a low-moderate intensity interval training session of rhythmic gymnastics has different effects on ROS production and antioxidant capacity, and a regular exercise can protect the trainers by oxidative stress.

References

- [1] Bloomer et al. (2005) Effects of acute aerobic and anaerobic exercise on blood markers of oxidative stress. *J Strength Cond Res* 19: 276–285.

Key words

Oxidative stress, antioxidant capacity, exercise training, exercise intensity, rhythmic gymnastics.